



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**NATIONAL VEHICLE AND FUEL EMISSIONS LABORATORY**  
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OFFICE OF  
AIR AND RADIATION

May 10, 2000

CCD-00-05 (LDV/LDT/SM/ICI/LIMO)

Dear Manufacturer:

SUBJECT: Changes to EPA's Data Base for SFTP Testing

Enclosure I provides an outline of recent changes which have been made to the Certification and Fuel Economy Information System (CFEIS) data base to accommodate the Supplemental Federal Test Procedure (SFTP) testing of 2001 model year and later certification vehicles. The changes are effective immediately.

For test groups certified to SFTP standards, manufacturers should follow the steps in Enclosure I to list SFTP data (i.e. the official US06, SC03 and FTP tests) on the EPA Summary Sheet report. For 2001 test groups already certified to SFTP standards, manufacturers should enter SFTP data and revise applicable Summary Sheets as soon as practicable.

Manufacturers are reminded to use the most current version of the CFEIS Manufacturers User Guide (CMUG) for guidance when submitting SFTP and other types of data to the EPA data base. It is available on the web at [www.epa.gov/otaq/cmug.htm](http://www.epa.gov/otaq/cmug.htm), and is updated on a daily or weekly basis.

If you have any questions about this letter, please contact your certification team representative.

Sincerely,

A handwritten signature in black ink, appearing to read "Gregory A. Green".

Gregory A. Green, Director  
Certification and Compliance Division  
Office of Transportation and Air Quality

Enclosure

## ENCLOSURE I

### SFTP Changes to EPA Data Base - 2001 Model Year and Later

#### General Overview

##### **1. General**

- a) SFTP includes two new driving cycles, i.e., US06 (representing more aggressive driving than FTP and SC03 (air conditioning).
- b). If the fuel is not gasoline or diesel, SFTP does not apply. (applies to gasoline portion of flexible or dual fuel vehicle)

##### **2. New Emission Standards**

- a) Separate (NMHC + NOX) standards for US06 and SC03 procedures for LEV and ULEV vehicles. **Composite (NMHC + NOX) standard** (weighted FTP/US06/SC03 results) for Tier 1 or TLEV vehicles.
- b) Separate CO standards for US06 and SC03 procedures for Tier1, TLEV, LEV and ULEV vehicles. **Optional composite CO standard** (weighted FTP/US06/SC03 results) for Tier 1 and TLEV vehicles.

##### **3. NMHC + NOX**

For **LEV or ULEV** vehicles, compliance will be determined based on the US06 and SC03 standards set for NMHC+NOX.

For **Tier 1 or TLEV** vehicles, compliance will be determined based on the composite emission cert level, as follows:

- a) For vehicles with air conditioning:

$$(\text{NMHC} + \text{NOX})_{\text{composite}} = .35(\text{NMHC} + \text{NOX})_{\text{FTP}} + .37(\text{NMHC} + \text{NOX})_{\text{SC03}} + .28(\text{NMHC} + \text{NOX})_{\text{US06}}$$

- b) For vehicles without air conditioning:

$$(\text{NMHC} + \text{NOX})_{\text{composite}} = .72(\text{NMHC} + \text{NOX})_{\text{FTP}} + .28(\text{NMHC} + \text{NOX})_{\text{US06}}$$

##### **4. CO**

For **LEVs and ULEVs**, individual standards for US06 and SC03 procedures have to be met.

For **Tier 1 and TLEV** vehicles, either the separate standards for US06 and SC03 or the optional composite (weighted FTP, US06 and SC03 results) standards apply.

##### **5. Optional Composite CO emission level for Tier 1 or TLEV vehicles**

- a) For vehicles with air conditioning:

$$\text{CO}_{\text{composite}} = .35\text{CO}_{\text{FTP}} + .37\text{CO}_{\text{SC03}} + .28\text{CO}_{\text{US06}}$$

- b) For vehicles without air conditioning:

$$\text{CO}_{\text{composite}} = .72\text{CO}_{\text{FTP}} + .28\text{CO}_{\text{US06}}$$

## **SFTP Changes to EPA Data Base - 2001 Model Year and Later**

### **CFEIS Implementation**

#### **1. Subsystems affected:**

ESI (Durability Group, Test Group) (data input, reports)  
 MTDS (data input, reports)  
 VI (data input, reports)  
 Shift Schedule (data input, reports)  
 Summary Sheet (data input, reports)

#### **2. ESI**

##### **2.1 Changes to the E1 Record**

Declare whether it is going to be SFTP compliant or not. (Due to phase- in schedule, not all will be SFTP)

E1 record column 93 ( 'Y' or 'N') - **SFTP compliance** (default to 'N')

For Tier 1 or TLEV vehicles (if it is SFTP compliant), declare whether composite CO standard is being opted or not.

E1 record column 95 ( 'Y' or 'N') - **Composite CO option** (default to 'N')

		Transaction Type										
Field Name	R e c o r d  T y p e	A d d	M o d i f y	R e p l a c e	D e l e t e	R e p l a c e	C e n s i t y	R e c o r d	P o s i t i o n	L e n g t h	D a t a  T y p e	Valid Range/Entry Criteria
SFTP Compliance	E1	X	X	X					93	1	A	Y or N (default)
SFTP Composite CO option for Tier1 or TLEV or other applicable tier levels	E1	X	X	X					95	1	A	Y or N (default)

##### **2.2 Emission names, standards and dfs that apply to EG records:**

Emission names, standards and dfs to be entered in the ESI system depend on the standards level (i.e., LEV, ULEV, Tier 1, TLEV) to which the test group is being certified, whether the composite CO standards option is taken and whether the manufacturer has developed separate dfs for US06 and/or SC03 procedures.

		Transaction Type										
Field Name	R e c o r d  T y p e	A d d	M o d i f y	R e p l a c e	D e l e t e	R e p o r t	C a n c e l	R e c e i v e	P o s i t i o n	L e n g t h	D a t a  T y p e	Valid Range/Entry Criteria
Emission Name	EG	R	R	R	R				16-31	16	A	New emission names applicable to SFTP  HC-NM-US06 - Non-methane hydrocarbon for US06 NOX-US06 - Nitrogen oxide for US06 HC-NM+NOX-US06 - HC-NM+NOX for US06 CO-US06 - Carbon monoxide for US06 HC-NM-SC03 - Non-methane hydr carbon for SC03 NOX-SC03 - Nitrogen oxide for SC03 HC-NM+NOX-SC03 - HC-NM+NOX for SC03 CO-SC03 - Carbon monoxide for SC03 HC-NM+NOX-COMP - SFTP Composite HC-NM+NOX CO-COMP - SFTP Composite CO

Refer to the CMUG (CFEIS Manufacturers' User Guide) for the full description of the above field.

### 2.2.1 For LEV or ULEV vehicles

(Also may apply to other tier levels to be identified later)

Emission Name	Standard	df	Useful Life
HC-NM+NOX-US06	Y	N	4k only
HC-NM+NOX-SC03	Y	N	4k only
CO-US06	Y	N	4k only
CO-SC03	Y	N	4k only

### 2.2.2 For Tier 1 or TLEV vehicles

**(Also may apply to other tier levels to be identified later)**

**1) If the composite CO standards option is not taken:**

a) If the manufacturer **has not** developed specific deterioration factors for US06 and/or SC03 procedures, two sets of emission standards and dfs must be entered (one for intermediate useful life and one for full useful life) as follows:

Emission Name	Standard	dfs	Useful Life
HC-NM+NOX-COMP	Y	N*	50k and 100/120k
CO-US06	Y	N*	50k and 100/120k
CO-SC03 (if applicable)	Y	N*	50k and 100/120k

\* dfs entered for HC-NM, NOX and CO for FTP will be used.  
If dfs for HC-NM have not been entered, dfs for NMOG will be used instead.

b) If the manufacturer **has** developed specific deterioration factors for US06 and/or SC03 procedures, two sets of emission standards and dfs must be entered (one for intermediate useful

life and one for full useful life) as follows:

Emission Name	Standard	dfs	Useful Life
<b>HC-NM+NOX-COMP</b>	<b>Y</b>	<b>N*</b>	<b>50k and 100/120k</b>
<b>CO-US06</b>	<b>Y</b>	<b>Y</b>	<b>50k and 100/120k</b>
<b>CO-SC03</b>	<b>Y</b>	<b>Y</b>	<b>50k and 100/120k</b>
<b>HC-NM-US06</b>	<b>N</b>	<b>Y</b>	<b>50k and 100/120k</b>
<b>HC-NM-SC03</b>	<b>N</b>	<b>Y</b>	<b>50k and 100/120k</b>
<b>NOX-US06</b>	<b>N</b>	<b>Y</b>	<b>50k and 100/120k</b>
<b>NOX-SC03</b>	<b>N</b>	<b>Y</b>	<b>50k and 100/120k</b>

\* dfs entered for HC-NM and NOX for FTP will be used.  
If dfs for HC-NM have not been entered, dfs for NMOG will be used instead.

2) If the **composite CO** standards option is taken:

a) If the manufacturer **has not** developed specific deterioration factors for US06 and/or SC03 procedures, two sets of emission standards and dfs must be entered (one for intermediate useful life and one for full useful life) as follows:

Emission Name	Standard	dfs	Useful Life
<b>HC-NM+NOX-COMP</b>	<b>Y</b>	<b>N*</b>	<b>50k and 100/120k</b>
<b>CO-COMP</b>	<b>Y</b>	<b>N*</b>	<b>50k and 100/120k</b>

\* dfs entered for HC-NM, NOX and CO for FTP will be used.  
If dfs for HC-NM have not been entered, dfs for NMOG will be used instead.

b) If the manufacturer has developed specific deterioration factors for US06 and/or SC03 procedures, two sets of emission standards and dfs must be entered (one for intermediate useful life and one for full useful life) as follows:

Emission Name	Standard	dfs	Useful Life
<b>HC-NM+NOX-COMP</b>	<b>Y</b>	<b>N*</b>	<b>50k and 100/120k</b>
<b>CO-COMP</b>	<b>Y</b>	<b>N*</b>	<b>50k and 100/120k</b>
<b>HC-NM-US06</b>	<b>N</b>	<b>Y</b>	<b>50k and 100/120k</b>
<b>HC-NM-SC03</b>	<b>N</b>	<b>Y</b>	<b>50k and 100/120k</b>
<b>NOX-US06</b>	<b>N</b>	<b>Y</b>	<b>50k and 100/120k</b>
<b>NOX-SC03</b>	<b>N</b>	<b>Y</b>	<b>50k and 100/120k</b>
<b>CO-US06</b>	<b>N</b>	<b>Y</b>	<b>50k and 100/120k</b>
<b>CO-SC03</b>	<b>N</b>	<b>Y</b>	<b>50k and 100/120k</b>

dfs entered for HC-NM, NOX and CO for FTP will be used.  
If dfs for HC-NM have not been entered, dfs for NMOG will be used instead.

### 2.2.3 Non-methane Hydrocarbon Emissions

a) For Tier 1 vehicles:

Emission Name	Standard	dfs	Useful Life
<b>HC-NM<sub>FTP</sub></b>	<b>Y</b>	<b>Y</b>	<b>50k and 100/120k</b>

(HC-NM<sub>FTP</sub> stands for HC-NM for FTP.)

b) For TLEV and other applicable tier level vehicles:

Emission Name	Standard	dfs	Useful Life
HC-NM <sub>FTP</sub>	N	Y*	50k and 100/120k

\* if dfs are not entered, the dfs entered for NMOG will be used in their place.

### 3. MTDS

#### 3.1 New Test Procedure Codes (T1 record, col 49-50)

- 90 - US06
- 95 - SC03 (full environmental chamber)
- 96 - SC03 (AC1 simulation)
- 97 - SC03 (AC2 simulation)

		Transaction Type											Valid Range/Entry Criteria
Field name	R e c o r d  T y p e	A d d  T y p e	M o d i f y e	R e p l a c e	D e l e t e	R e c o r d - O v e r r i d e s	C a r r y - O v e r r i d e s	C a r r y - O v e r r i d e s	R e c o r d - O v e r r i d e s	P o s i t i o n	L e n g t h	D a t a  T y p e	
Test Procedure	T1	R	R	R					R	49-50	2	I	Test Procedure codes applicable to SFTP  90 - US06 95 - SC03 96 - SC03 (AC1) 97 - SC03 (AC2)

Refer to the CMUG (CFEIS Manufacturers' User Guide) for the full description of the above field.

#### 3.2 Emission names and results to be entered in MTDS.

HC-NM-US06  
NOX-US06  
CO-US06  
HC-TOTAL-US06  
CO2-US06

HC-NM-SC03  
NOX-SC03  
CO-SC03  
HC-TOTAL-SC03  
CO2-SC03

		Transaction Type											Valid Range/Entry Criteria
Field name	R e c o r d  T y p e	A d d i t i o n a l	M o d i f y	R e d u c e	D e l e t e	R e p l a c e	C o r r e c t	C o r r e c t	R e p l a c e	P o s i t i o n	L e n g t h	D a t a  T y p e	
Unrounded Emission Result Name	TR	M	X	X						4-19	16	A	New emission names applicable for SFTP  HC-TOTAL-US06 - Total hydrocarbon for US06 CO2-US06 - Carbon dioxide for US06 HC-NM-US06 - Non-methane hydrocarbon for US06 NOX-US06 - Nitrogen oxide for US06 CO-US06 - Carbon monoxide for US06 HC-TOTAL-SC03 - Total hydrocarbon for SC03 CO2-SC03 - Carbon dioxide for SC03 HC-NM-SC03 - Non-methane hydr carbon for SC03 NOX-SC03 - Nitrogen oxide for SC03 CO-SC03 - Carbon monoxide for SC03

Refer to the CMUG (CFEIS Manufacturers' User Guide) for the full description of the above field.

### 3.3 Calculation of certification levels

#### 3.3.1 LEV and ULEV vehicles

(Also may apply to other tier levels to be identified later)

##### 3.3.1.1 Calculation of certification level for HC-NM+NOX for US06 (test procedure code 90) tests.

###### 3.3.1.1.1 Determine whether to calculate cert level for HC-NM+NOX for US06.

- Determine that the test procedure code is 90 (US06) and that the Tier code is LEV, ULEV or one of other applicable tier codes to be identified later.
- A standard for HC-NM+NOX-US06 has been entered in the ESI (EG record, position 46-60) and stored in the data base table EG\_STD\_XREF.
- Determine that valid unrounded emission results exist for HC-NM-US06 and NOX-US06.

###### 3.3.1.1.2 Calculation Method

- Round HC-NM-US06 and NOX-US06 to 1 additional significant digit beyond the HC-NM+NOX-US06 emission standard (4k standard only).

- Calculate the (4k) certification level as follows:

$$\frac{(\text{HC-NM+NOX-US06})_{\text{cert level}}}{\text{HC-NM-US06} + \text{NOX-US06}} = \text{ASTM ROUND}(\text{same number of decimal places as the standard}) \left[ \frac{\text{HC-NM-US06} + \text{NOX-US06}}{\text{HC-NM-US06} + \text{NOX-US06}} \right] \quad (\text{using the HC-NM-US06 and NOX-US06 values rounded as above})$$

#### 3.3.1.1.3 Reports

- A pass/fail report for US06 emissions will be generated and placed in the MTDS output file.

### 3.3.1.2 Calculation of certification level for HC-NM+NOX for SC03 (test procedure code 95, 96 or 97) tests.

#### 3.3.1.2.1 Determine whether to calculate cert level for HC-NM+NOX for SC03.

- Determine that the test procedure code is 95, 96 or 97 and that the Tier code is LEV, ULEV or one of other applicable tier codes to be identified later.
- A standard for **HC-NM+NOX-SC03** has been entered in the ESI (EG record, position 46-60) and stored in the data base table EG\_STD\_XREF.
- Determine that valid unrounded emission results exist for **HC-NM-SC03** and **NOX-SC03**.

#### 3.3.1.2.2 Calculation Method

- Round **HC-NM-SC03** and **NOX-SC03** to 1 additional significant digit beyond the HC-NM+NOX-SC03 emission standard (4k standard only).
- Calculate the (4k) certification level as follows:

$$\frac{(\text{HC-NM+NOX-SC03})_{\text{cert level}}}{\text{HC-NM-SC03} + \text{NOX-SC03}} = \text{ASTM ROUND}(\text{same number of decimal places as the standard}) \left[ \frac{\text{HC-NM-SC03} + \text{NOX-SC03}}{\text{HC-NM-SC03} + \text{NOX-SC03}} \right] \quad (\text{using the HC-NM-SC03 and NOX-SC03 values rounded as above})$$

#### 3.3.1.2.3 Reports

- A pass/fail report for SC03 emissions will be generated and placed in the MTDS output file.

### 3.3.1.3 Calculation of certification levels for CO for US06 (test procedure code 90) and/or SC03 (test procedures 95, 96 and 97) tests.

#### 3.3.1.3.1 Determine whether to calculate cert level for CO for US06 and/or SC03.

- Determine that the test procedure code is 90 (US06), 95, 96 or 97 (SC03) and that the Tier code is LEV, ULEV or one of other applicable tier codes to be identified later.
- Standards for **CO-US06** and/or **CO-SC03** have been entered in the ESI (EG record, position 46-60) and stored in the data base table EG\_STD\_XREF.
- Determine that valid unrounded emission results exist for **CO-US06** and/or **CO-SC03**.

#### 3.3.1.3.2 Calculation Method

- Round **CO-US06** and/or **CO-SC03** to 1 additional significant digit beyond the appropriate **CO-US06** or **CO-SC03** standard.



- Calculate the (4k) certification level as follows:

$$\begin{aligned}
 (\text{CO-US06})_{\text{cert level}} &= \text{ASTM ROUND}(\text{same number of decimal places as the standard})[\text{CO-US06}] \text{ (using the CO-US06 value rounded as above)} \\
 (\text{CO-SC03})_{\text{cert level}} &= \text{ASTM ROUND}(\text{same number of decimal places as the standard})[\text{CO-SC03}] \text{ (using the CO-SC03 value rounded as above)}
 \end{aligned}$$

### 3.3.1.3.3 Reports

- A pass/fail report for US06 and SC03 emissions will be generated and placed in the MTDS output file.

### 3.3.2. TIER 1 and TLEV Vehicles

(Also may apply to other tier levels to be identified later)

#### 3.3.2.1 Individual Tests

- If SFTP code in ESI is 'Y', unrounded **HC-NM+NOX** values will be calculated for individual FTP, US06 and SC03 tests and stored in the data base table **UNRND\_EMSN\_RSLT**.
- Separate **CO** certification levels will be calculated for the **US06** (test procedure 90) and **SC03** (test procedure code 95, 96 or 97) tests if the **Composite CO** option code entered in the ESI (E1 record, position 95) and stored in the data base is "N".
  - Calculation procedure is the same as any other regular emission component except for the retrieval of dfs for the emission components **CO-US06** and **CO-SC03**.
  - If dfs for **CO-US06** and/or **CO-SC03** have been entered (and exist in the data base table **EG\_STD\_XREF**), they will be used.
  - If dfs for **CO-US06** and/or **CO-SC03** have not been entered (and does not exist in the data base table **EG\_STD\_XREF**), dfs entered for **CO<sub>FTP</sub>** will be used.
- **Composite CO** values will be calculated, as described in section 3.3.2.2.2.B if the Composite CO option code entered in the ESI (E1 record, position 95) and stored in the data base is "Y".

#### 3.3.2.2 Calculation of composite certification level

for **HC-NM+NOX** (emission name **HC-NM+NOX-COMP**) and **CO** (**CO-COMP**)

A new **MTDS** record type **TF** is introduced to identify the **FTP**, **US06** and **SC03** (if applicable) test numbers that are to be used in the calculation of composite **HC-NM+NOX** and optional **composite CO** calculations for Tier 1, TLEV or other applicable tier level vehicles.

This record should be submitted only after all the applicable FTP and SFTP manufacturer tests have been successfully submitted, errors have been corrected and results have been verified. A set of TF and ZZ records can be submitted either by itself or with any other MTDS transaction.

After an EPA confirmatory test has been conducted, the manufacturer should submit a new MTDS TF transaction with the appropriate test numbers.

Note: A TF record should not be submitted for LEV and ULEV vehicles.

		Transaction Type									
Field name	R e c o r d  T y p e	A d d	R e p l a c e	D e l e t e	R e p o r t	R e p r o c e s s	P o s i t i o n	L e n g t h	D a t a  T y p e	Valid Range/Entry Criteria	
Input Record Type	TF	R	R	R	R	R	1-2	2	A	TF	
Process Code	TF	R	R	R	R	R	3-3	1	A	For Add: 'A' or blank - '' For Replace: 'R' For Delete: 'D' For Report: 'P' For Reprocess: 'S'	
Manufacturer Code	TF	R	R	R	R	R	4-7	4	I	Note: See Appendix F Valid MANUFACTURER CODE	
Model Year	TF	R	R	R	R	R	9-12	4	I	2001-2100	
FTP test number (for composite calculation)	TF	R	R	R	R	R	14-20	7	I	test number of FTP test procedure used for NMHC+NOX and optionally for CO	
Vehicle Configuration number	TF	R	R	R	R	R	22-23	2	I	Vehicle configuration number of test vehicle used for FTP test (above)	
US06 test number (for composite calculation)	TF	R	R				25-31	7	I	test number of US06 test procedure used for NMHC+NOX and optionally for CO	
Vehicle Configuration number	TF	R	R				33-34	2	I	Vehicle configuration number of test vehicle used for US06 test (above)	
SC03 test number (for composite calculation)	TF	X	X				36-42	7	I	test number of SC03 test procedure used for NMHC+NOX and optionally for CO ( if applicable)	
Vehicle Configuration number	TF	R	R				44-45	2	I	Vehicle configuration number of test vehicle used for SC03 test (above)	
End of transaction	ZZ						1-2			End of transaction record	

For example, an MTDS submission could look like

TF 0999 2001 1234567 00 1234568 02 1234569 01  
 ZZ  
 T1 xxxxxxxx  
 T2 xxxxxxxxxx  
 T3 xxxxxx  
 T4 xxxxxx  
 TR xxxxxx  
 ZZ

TF 0999 2001 1234123 01 1234125 02  
ZZ

or

TF 0999 2001 1234567 00 1234568 00 1234569 01  
ZZ  
TF 0999 2001 1234123 00 1234125 01  
ZZ

### 3.3.2.2.1 Validation

- Tier code has to be T1, TLEV or other tier levels to be identified later.

Tier code will be picked up for:  
the fuel type used for the test (diesel or gasoline only)  
ESI system number 1, sub-system number 1  
lowest useful life  
Cert/In Use Code of 'C'  
Emission name 'CO'

- Each test number field needs to be validated for:

Existence in the data base (mfr code, model year, configuration number)  
Correct test procedure code  
Correct combination - valid combinations are :  
**FTP, US06 and SC03**  
**FTP and US06:**

### 3.3.2.2.2 Calculation

#### A) Calculation of Composite Cert Level for HC-NM+NOX-COMP

Both 50k and 100/120k composite certification levels will be calculated whenever a TF record is entered into MTDS. The pass/fail report for composite HC-NM+NOX-COMP will be included with the pass/fail report for the FTP test.

After an EPA confirmatory test has been conducted, the manufacturer should submit a new MTDS TF transaction with the appropriate test numbers.

If there are **FTP, US06 and SC03** tests listed on the TF record:

$$\begin{aligned} &(\text{HC-NM+NOX-COMP})_{\text{cert level}} = \text{ASTM ROUND}(\text{same number of decimal places as the standard}) \\ &[.35(\text{HC-NM} \times \text{df}_{\text{HC-NM}} + \text{NOX} \times \text{df}_{\text{NOX}})_{\text{FTP}} \\ &+ .28(\text{HC-NM-US06} \times \text{df}_{\text{HC-NM-US06}} + \text{NOX-US06} \times \text{df}_{\text{NOX-US06}}) \\ &+ .37(\text{HC-NM-SC03} \times \text{df}_{\text{HC-NM-SC03}} + \text{NOX-SC03} \times \text{df}_{\text{NOX-SC03}})] \end{aligned}$$

If there are **FTP, US06** tests listed on the TF record:

$$\begin{aligned} &(\text{HC-NM+NOX-COMP})_{\text{cert level}} = \text{ASTM ROUND}(\text{same number of decimal places as the standard}) \\ &[.72(\text{HC-NM} \times \text{df}_{\text{HC-NM}} + \text{NOX} \times \text{df}_{\text{NOX}})_{\text{FTP}} \\ &+ .28(\text{HC-NM-US06} \times \text{df}_{\text{HC-NM-US06}} + \text{NOX-US06} \times \text{df}_{\text{NOX-US06}})] \end{aligned}$$

Note: In the above equations,

- (1) multiplicative df was assumed. If df is additive, + sign would replace the x sign.
- (2) HC-NM, HC-NM-US06, HC-NM-SC03, NOX, NOX-US06 and NOX-SC03 emission results are **rounded to 1 additional significant digit beyond the HC-NM+NOX-COMP standard** before dfs are applied (when calculating both 50k and 100/120k certification levels).

- dfs (50k and 100/120k) to use for the calculation:
  - Dfs for **HC-NM<sub>FTP</sub>** and **NOX<sub>FTP</sub>** will be applied to **HC-NM<sub>FTP</sub>** and **NOX<sub>FTP</sub>** emissions.
  - If the **HC-NM<sub>FTP</sub>** dfs are not available, the **NMOG<sub>FTP</sub>** dfs will be used.
  - If the dfs for **HC-NM-US06** and **NOX-US06** have been entered in the ESI (EG record, position 46-60) and stored in the data base table **EG\_STD\_XREF**, they will be used.  
If one df is missing, it is an error and the report will contain an error message to that effect.  
If neither exists, the dfs for **HC-NM<sub>FTP</sub>** (or **NMOG<sub>FTP</sub>** if **HC-NM<sub>FTP</sub>** does not exist) and **NOX<sub>FTP</sub>** will be used in their place.
  - If the dfs for **HC-NM-SC03** and **NOX-SC03** have been entered in the ESI (EG record, position 46-60) and stored in the data base table **EG\_STD\_XREF**, they will be used.  
If one df is missing, it is an error and the report will contain an error message to that effect.  
If neither exists, the dfs for **HC-NM<sub>FTP</sub>** (or **NMOG<sub>FTP</sub>** if **HC-NM<sub>FTP</sub>** does not exist) and **NOX<sub>FTP</sub>** will be used in their place.

## B) Calculation of Composite Cert Level for CO

Both 50k and 100/120k composite Cert Levels will be calculated whenever a TF record is entered into MTDS and the Composite CO option code of 'Y' has been entered in the ESI (E1 record, position 95). After an EPA confirmatory test has been conducted, the manufacturer should submit a new MTDS TF transaction with the appropriate test numbers. The pass/fail report for composite CO-COMP emissions will be included with the pass/fail report for the FTP test.

If there are **FTP**, **US06** and **SC03** tests listed on the TF record and a **COMPOSITE CO** option flag of 'Y' was entered in the (ESI E1 record, position 95) and stored in the data base:

$$\begin{aligned}
 (\text{CO-COMP})_{\text{cert level}} &= \text{ASTM ROUND}(\text{same number of decimal places as the standard}) \\
 &[ .35(\text{CO} \times \text{df}_{\text{CO}})_{\text{FTP}} \\
 &+ .28(\text{CO-US06} \times \text{df}_{\text{CO-US06}}) \\
 &+ .37(\text{CO-SC03} \times \text{df}_{\text{CO-SC03}})]
 \end{aligned}$$

If there are **FTP**, **US06** tests listed on the TF record and a **COMPOSITE CO** option flag of 'Y' was entered in the ESI (E1 record, position 95) and stored in the data base:

$$\begin{aligned}
 (\text{CO-COMP})_{\text{cert level}} &= \text{ASTM ROUND}(\text{same number of decimal places as the standard}) \\
 &[ .72(\text{CO} \times \text{df}_{\text{CO}})_{\text{FTP}} \\
 &+ .28(\text{CO-US06} \times \text{df}_{\text{CO-US06}})]
 \end{aligned}$$

- Note: 1) In the above equations, multiplicative df was assumed. If the df is additive, + sign would replace the x sign.
- 2) CO, CO-US06, CO-SC03 in the above equations are rounded to 1 additional significant digit beyond the CO-COMP standard before the dfs are applied (when calculating both 50k and 100/120k cert levels).

- dfs (50k and 100/120k) to use for the calculation:
  - Dfs for **CO<sub>FTP</sub>** will be applied to the **CO<sub>FTP</sub>** emissions.
  - If dfs for **CO-US06** or **CO-SC03** have been entered in the ESI (EG record, position 46-60) and stored in the data base table **EG\_STD\_XREF**, they will be used.
  - If they have not been entered, the dfs for **CO<sub>FTP</sub>** will be used in their place.

### 3.4 MTDS Reports

#### 3.4.1 Tier 1 and TLEV Vehicles:

(Also may apply to other tier levels to be identified later)

- When a TF record is processed, a report will be generated showing applicable composite certification levels and pass/fail status.
- When a report is generated for the FTP test number which was included in a composite certification level calculation, the certification levels for HC-NM+NOX-COMP and CO-COMP(if applicable) are displayed in the PASS/FAIL report page and the following line is added at the end of the report.

" SFTP (Supplemental Federal Test Procedure) test numbers used for the composite HC-NM+NOX and CO (optional) certification levels: xxxxxxxx(US06), xxxxxxxx(SC03)"

#### 3.4.2 LEV and ULEV Vehicles:

(Also may apply to other tier levels to be identified later)

- Reports will be generated for US06 and SC03 when the MTDS data is processed for each individual test. Reports are placed in the usual MTDS output file.

### 4. VI

- New Test Procedure codes (VT record, columns 5-6) and Shift Schedule IDs (VT record, column 13-16):

		Transaction Type									Valid Range/Entry Criteria
Field Name	R e c o r d  T y p e	A d d  T y p e	M o d i f y e	D e l e t e	C h a n g e	R e p l a c e	C o r r e c t  O v e r	P a s s i t i o n	L e n g t h	D a t a  T y p e	
Test Procedure Code	VT	R	R	R	R			5-6	2	I	Test procedure codes applicable to SFTP  90 - US06 95 - SC03 96 - SC03 (AC1) 97 - SC03 (AC2)
Shift Schedule Id	VT	R	X		X			13-16	4	A	New EPA standard shift schedule ID applicable to SFTP for automatic transmissions. (No standard shift schedules are available for manual transmissions)  US6A - for US06

Refer to the CMUG (CFEIS Manufacturers' User Guide) for the full description of the above fields.

- For **US06** test procedure, **shift schedule ID is required**. For manual transmissions, the manufacturer should enter appropriate shift schedule data in the CFEIS Shift Schedule system before entering the ID in the VT record.
- For **SC03** test procedures, **shift schedule ID need not** be entered. To enter a shift schedule ID for SC03 in the VT record, the ID and data must have been previously entered in the CFEIS Shift Schedule data base.

## 5. Shift Schedule

There is no change to the Shift Schedule program. For US06 tests, manufacturers should enter shift schedules into EPA's CFEIS data base unless the EPA standard shift schedule is used (automatic transmission only). **For SC03 tests, shift schedule information need not be entered.**

## 6. Summary Sheets

### 6.1 Summary Sheet Data Entry

- Enter the test numbers of the official US06 and SC03 tests on the Summary Sheet XT record including the FTP test used to demonstrate compliance with composite standards (if applicable). For example, to show compliance with the composite NMHC+NOX and CO standards, enter the FTP, US06 and SC03 test number on the Summary Sheet XT record that were entered on the MTDS TF record..
- If valid EPA confirmatory tests were conducted, enter the EPA test numbers (and do not enter the corresponding manufacturer test numbers).

### 6.2 Summary Sheet Reports

- The Summary Sheet report will include a one page output report for each test number which is entered on the Summary Sheet XT record. For SFTP tests, the format of the report is similar to current Summary Sheet reports, listing test vehicle parameters, test procedure, test fuel, emission results, dfs, etc.
- If ESI indicates SFTP compliance ( SFTP Compliance code "Y"), the following line is added at the end of the Test Group Specifications section of the first page of the Summary Sheet report.  

"\* These vehicles were certified to SFTP (Supplemental Federal Test Procedure) standards."
- In the test report pages, if the test procedure code is FTP(02,21,25,31,35,41) and if it was used for composite emission certification level calculation, the following line is printed at the end of the report.  

" SFTP (Supplemental Federal Test Procedure) test numbers used for the composite HC-NM+NOX and CO (optional) certification levels: xxxxxxxx(US06), xxxxxxxx(SC03)"